

**OP 09****Three Newly Designed Methods to Calculate Percentage Haemolysis of Red Cell Concentrates before Transfusion**

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**Background:** The degree of hemolysis must be checked prior to transfusion of Red Cell Concentrates (RCC), to prevent potential adverse effects that can occur in patients due to transfusion of haemolysed blood. To calculate percentage hemolysis, plasma hemoglobin (Hb) must be determined, which is measured using a Plasma/Low Hb photometer (LHBP) which is currently at the National Blood Centre (NBC).

**Objectives:** To introduce three new alternative methods to calculate percentage haemolysis of RCC in blood banks.

**Methods:** Applying principles of Hb estimation, three new alternative methods are designed to estimate plasma Hb of RCC and named as visual Hb Colour Scale (CS), Spectrophotometric Calibration Graph (SCG) and Standard haemolysate Capillary Tube Comparison (SCTC). A standard haemolysate was prepared by using an un-expired RCC pack. Using the standard haemolysate, a series of Hb concentrations from 0.1 - 1.0 g/dL were prepared. Among the blood packs received for the determination of percentage haemolysis, 68 blood packs were used in the newly designed three alternative methods. The data obtained was used to draw simple linear regression graphs for all three methods. The results generated by each method was compared with LHBP.

**Results:** A strong correlation was observed ( $p < 0.001$ ) between newly developed methods and LHBP. All three simple linear regression models built had  $p < 0.001$  significance with beta values closer to 1. The SCTC method highly correlated with the LHBP method as per the  $R^2$  values of the simple linear regression models built considering gold standard method and the three alternative methods.

**Conclusions:** Three newly developed alternative methods can be used to estimate plasma Hb in RCC with higher degree of accuracy. Of all three methods, SCTC method showed superior performance.

**Keywords:** *Capillary tube comparison, Haemoglobin colour scale, Percentage of haemolysis, Plasma/Low haemoglobin photometer, Red cell concentrate*